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ABSTRACT

This report analyzes the progress made in implementing the Illinois Board of Higher Education's policies on undergraduate education, with particular attention to the status of policy implementation concerning student achievement, scholarship, and general education. The report examines recent trends in the number of Illinois high school graduating seniors and first-time freshman enrollment in Illinois institutions of higher education and provides various data on high school student preparation for college and freshman performance in college in a period when new high school course-specific admission requirements have been widely publicized but not yet fully implemented statewide. The following are among the findings of the review: (1) from 1986 to 1990 the number of Illinois graduating seniors declined by just under 7 percent, while the number of first-time freshmen entering Illinois institutions of higher education increased by 3.6 percent; (2) the greatest increase in enrollment of first-time freshmen occurred in public community colleges; (3) the gap in achievement between minority and majority students narrowed; (4) completion rates for the recommended high school college-preparatory curriculum were up; and (5) of freshmen at public institutions one in five fail their first mathematics course. Included are extensive tables and figures, appendixes containing relevant legislative and policy statements, and 28 references. (JB)

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Item #8
March 3, 1992

STATE OF ILLINOIS
BOARD OF HIGHER EDUCATION

UNDERGRADUATE EDUCATION

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Item #8
March 3, 1992

STATE OF ILLINOIS
BOARD OF HIGHER EDUCATION

## UNDERGRADUATE EDUCATION

This report analyzes the progress made in implementing the Board of Higher Education's policies on undergraduate education. Improving the quality of undergraduate education has been a state priority since the Board adopted the policies recommended by its Committee on the Study of Undergraduate Education.

In September 1986, the Board of Higher Education adopted a series of policies recommended by its Committee on the Study of Undergraduate Education. These policies established the improvement of undergraduate education as a state priority and called for improvements in three areas: student preparation and remediation; student achievement, scholarship, and general education; and faculty and excellence in teaching. Annual reports on the implementation of these policies were presented to the Board. In October 1989, the Board reconvened the Committee on the Study of Undergraduate Education to review the annual status reports and to recommend any modifications to the policies that might be needed. In September 1990, the Board of Higher Education adopted the Committee's recommended revisions to its policies on undergraduate education. These revised and extended policies reaffirmed the Board's commitment to improving the quality of undergraduate education statewide and established four areas for improvement: student preparation, access, and retention; student achievement, scholarship, and general education; transfer and articulation; and faculty and excellence in teaching.

Item #8A, *Undergraduate Education: Access and Preparation*, analyzes the status of student preparation for college in a period when new high school course-specific admission requirements have been widely publicized but have not yet been fully implemented statewide. The first report in this series, *Undergraduate Education: Learning and Teaching*, presented to the Board in January 1992, examined actions taken by public universities and community colleges to improve undergraduate education by strengthening graduation requirements and assisting students in meeting them. The text of the first report, without the appendices, is reproduced as Item #8B.

In examining the quality of undergraduate education in Illinois colleges and universities, the Board of Higher Education and its Committee on the Study of Undergraduate Education concluded that standards needed to be strengthened both at entry to college and at baccalaureate graduation. At both entry and exit, the Board called on colleges and universities to establish high expectations and standards for student achievement, to publicize the expectations and standards widely, and to assist students in meeting them. The chart on the next page provides an overview of the actions being taken to strengthen, publicize, and assist students in meeting standards both at entry and during the undergraduate experience. Initiatives to strengthen entry standards and student preparation for college are presented in Item #8A, while initiatives to strengthen exit standards and student performance in undergraduate education are discussed in Item #8B.

A third report, planned for May, will analyze implementation of the policies on student transfer and program articulation.

HE 025 938

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## IMPROVING THE QUALITY OF UNDERGRADUATE EDUCATION

| | Preparation/Entry | Undergraduate/Exit |
|---|---|---|
| **Establish Standards and Expectations** | Admission Requirements:<br>—Minimum high school course requirements<br>—Entrance Exams (ACT, SAT)<br>—Class rank and grade point average | Graduation Requirements:<br>—General education<br>—Baccalaureate-level skills<br>—Program major<br>—Minimum credits and grade point average |
| **Publicize Standards and Expectations** | Statement on "Preparing for College" sent to high school students via superintendents, principals, counselors, and board presidents<br>*Learning Outcomes for College-Bound Students*<br>College and university catalogs, admission brochures, and application forms<br>College and university admission counselors working with high school counselors<br>College Nights/Fairs | College and university catalogs and academic program brochures<br>New-student orientation programs<br>Academic advising |
| **Assist in Meeting Standards** | School-College Partnerships to improve education<br>Early outreach programs for at-risk and advanced students<br>Summer bridge or transition programs<br>Teacher preparation and in-service training<br>High School Feedback System reports | Academic advising<br>Entry-level skills assessment for course placement: remedial, freshman, and advanced<br>General education and major courses<br>Honors Programs<br>Provide guidance through:<br>—Tutoring programs<br>—Mentoring programs<br>—Supplemental sections in gateway courses<br>—Workshops on study skills, note and test taking, and time management<br>—Career exploration and planning programs<br>Assessment of achievement of baccalaureate-level skills and of objectives in general education and the major |

Item #8A
March 3, 1992

STATE OF ILLINOIS
BOARD OF HIGHER EDUCATION

# UNDERGRADUATE EDUCATION: ACCESS AND PREPARATION

## OVERVIEW

This report is the second of three reports during 1992 that, together, analyze the progress made in implementing the Board of Higher Education's policies on undergraduate education. This report reviews the Board's policies on college and university admission requirements and analyzes the implementation of the Board's policies on student preparation, access, and retention.

The first report, *Undergraduate Education: Learning and Teaching* (January 1992), focused on the implementation of the Board's policies on student achievement, scholarship, and general education and on faculty and excellence in teaching. The third report, planned for May, will analyze implementation of the policies on student transfer and program articulation. Together, this series of reports present a comprehensive picture of the current status of undergraduate education in Illinois public higher education.

This report examines recent trends in the number of Illinois high school graduating seniors and first-time freshman enrollment in Illinois higher education. The report also analyzes in detail a variety of data on high school student preparation for college and freshman performance in college in a period when new high school course-specific admission requirements have been widely publicized but have not yet been fully implemented statewide.

### Access

- From 1986 to 1990, the number of Illinois graduating seniors declined by just under seven percent, while the number of first-time freshmen entering Illinois institutions of higher education increased by 3.6 percent.

- The greatest increase in enrollment of first-time freshmen occurred in public community colleges, at 14.8 percent.

### Student Preparation

- There is a wide range in student achievement at each schooling level, as indicated by scores on state and national tests of student achievement and of aptitude for college work. Various standardized tests indicate that, while the top high school graduating seniors achieve at high levels, they are very few in number. Test scores further indicate that the majority of graduating seniors have not achieved the level of verbal, quantitative, and reasoning skills essential for success in college work.

- Although the gap in achievement between minority and majority students is narrowing, the achievement of minority students on average continues to be lower than the achievement of majority students. The achievement of females in mathematics and science continues to be lower than that of males.

- The number of Illinois ACT test takers who reported taking the recommended core college-preparatory curriculum in high school increased by 65 percent over the past five years, from 16,481 in 1987 to 27,152 in 1991. In 1991, 37 percent of the Illinois test takers reported taking the complete college-preparatory curriculum.

- Most first-time freshmen entering Illinois public universities in 1988 through 1990 completed the recommended number of years in English, mathematics, and science that will be required for admission statewide in fall 1993. From 1988 through 1990, at least 84 percent of the public university first-time freshmen completed four years of English, 82 percent completed three (or more) years of mathematics, and 69 percent completed three (or more) years of science in high school.

- Completing only a specified number of years of a subject in high school, however, is not sufficient by itself to guarantee adequate preparation for collegiate study. The level and content of the courses completed, the grade earned in each course, and the academic standards of the high school attended all contribute to the adequacy of a student's preparation.

First-Term College Performance

- ACT composite scores, high school percentile rank, and high school course-taking patterns are interrelated measures of student performance that together can predict student performance in the freshman year of college.

- A student's ACT composite score and high school percentile rank are positively related to first-term college performance. The number of years of a subject a student completed in high school also relates positively to the level of that subject and the grade the student earns in it during the first term in college.

- A small proportion of students enroll in remedial work in higher education institutions in Illinois. In fiscal year 1991, only five percent of the total annual credit hours generated in the public community college system were remedial, with more students enrolling in remedial mathematics than in remedial reading or writing. Over a three-year period, only seven percent of the first-time freshmen who entered public universities enrolled in a remedial English course, while 13 percent enrolled in a remedial mathematics course.

- A significant proportion of first-term freshmen in public universities are unsuccessful, with one in five failing their first course in mathematics, and one in five failing their first science course.

- The level of student academic preparation for college and the level of first-term performance in college described in this report indicate that the revisions to entry-level assessment for course placement purposes, increased attention to the freshman year and to retention, and increased levels of student support through tutoring programs and supplemental sections in gateway courses, as reported in *Undergraduate Education: Learning and Teaching*, are both warranted and necessary.

- The level of student academic preparation for college described in this report also indicates that colleges and universities in working with schools and the Board of Higher Education in working with the State Board of Education should give renewed emphasis to informing high school students and their parents and teachers of the expected level of preparation for admission to and success in college.

# UNDERGRADUATE EDUCATION: ACCESS AND PREPARATION

This report is the second of three reports during 1992 that, together, analyze the progress made in implementing the Board of Higher Education's policies on undergraduate education. This report on access and preparation focuses on the Board's policies on college and university admission requirements, as well as on the implementation of the Board's policies on student preparation, access, and retention. The report examines in detail a variety of data on high school student preparation for college and freshman performance in college in a period when new high school course-specific admission requirements have been widely publicized but have not yet been fully implemented statewide.

This report is divided into three sections. The first section reviews the history of Illinois higher education admission requirements and presents recent trends in access to Illinois higher education. The second section examines trends in national and state measures of the academic achievement of high school students and analyzes freshman performance in college. The third and final section draws conclusions from these data and discusses next steps in school-college partnership efforts to improve the preparation of students for college.

## Admission and Access

The 1961 statute creating the Illinois Board of Higher Education authorized the Board to set minimum admission standards for public colleges and universities. Until 1985, the Board chose not to exercise this authority, preferring instead to defer to each governing board to establish minimum admission standards consistent with the courses of study offered by the individual institutions. The Board's decision in November 1985 to adopt high school course-specific requirements for admission to baccalaureate and baccalaureate-transfer programs offered by public institutions reflected a growing concern about the quality of education at all levels. This section traces the development of statewide admission standards and examines aspects of student access to higher education.

### History of Illinois Admission Requirements

In 1977, Illinois Senate Resolution 180 requested the Board of Higher Education to provide information about the extent of remediation in public higher education. The Board's report in September indicated that, in fiscal year 1976, a total of 16,401 students enrolled in remedial courses in public universities, and 377,718 students enrolled in remedial courses in public community colleges. In both cases, however, the figures were *duplicated* headcounts--that is, a single student was counted twice if he/she enrolled in both a remedial English and a remedial mathematics course. The public community colleges also reported that 778,437 remedial semester credit hours were generated in fiscal year 1976, which was equal to 25,948 full-time-equivalent students. As a result of this report and similar concern at the State Board of Education, the Joint Education Committee recommended five resolutions on remediation that were adopted by both the State Board of Education and the Board of Higher Education in 1978. A key element in these resolutions was the stipulation that degree credit should not be awarded by colleges and universities for remedial coursework.

In 1979, the General Assembly adopted Public Act 81-803 requiring the Board to "develop guidelines which: (1) place the emphasis on postsecondary remedial programs at Public Community Colleges and (2) reduces the role of the state universities in offering remedial programs." In addition, the Board was to report to the General Assembly by June 30, 1981, "the progress made toward this transition." The June 1981 report to the General Assembly indicated that in fiscal year 1980 less than one percent of total public university credit hours and approximately two percent of total community college credit hours were remedial and that "progress in reducing remediation varies by university

campus." The report concluded by requesting public university governing boards and the Illinois Community College Board to re-assess remedial efforts by July 1983.

The year 1983 proved to be a watershed. In February, the Board of Higher Education's Committee on Higher Education and Economic Development recommended that "admission to colleges and universities should require more coursework in mathematics and the sciences at the high school level, while maintaining a strong commitment to communication skills." In April, the Board received a staff report prepared for the Joint Education Committee on *The Quality of Education in Illinois*. This report, which reviewed concerns being expressed by an increasing number of groups both nationally and in Illinois, initiated a multi-year study of undergraduate education. In its discussion of methods for improving student academic preparation for college, the report directly linked the remediation issue to college admission requirements:

> The preparation of students for postsecondary education includes the short-term problem of providing remediation for students who lack adequate preparation and the longer term problem of upgrading secondary school preparation either through increased high school graduation requirements or increased college admission requirements.

In July, the *Status Report on Remediation in Higher Education* indicated that, while credit toward graduation for remedial coursework had been eliminated, the amount of remediation occurring had increased since 1980 rather than diminishing. Finally, in November, the Board adopted a resolution offering the following advice to high school students preparing for college:

> The Board of Higher Education encourages high school students who plan to obtain a baccalaureate degree to choose subjects in high school which will preserve as many options as possible for further education and future careers. To accomplish this, the Board recommends that high school students who wish to prepare for a baccalaureate degree should complete four years of study in each of the following: English (emphasizing written and oral communication and literature), social studies (emphasizing history and government), mathematics (introductory through advanced algebra, geometry, trigonometry, and fundamentals of computer programming), and the sciences (including biology, chemistry, and physics). In addition, study of a foreign language for at least two years is encouraged.

To make this advice known, all Illinois school district superintendents, school principals and counselors, and school board presidents were sent a letter soliciting their assistance in distributing a statement of advice to all eighth grade and high school students across the state. At the same time, the Board also directed public colleges and universities to revise their admission standards for programs leading to the baccalaureate degree by designating specific subjects to be completed in high school. Public universities were to report their actions by July 1985.

In offering advice to high school students, as well as to the schools, the Board intended to provide a clear and consistent signal of what was expected of entering college students. The admission requirements submitted by each public university in 1985, however, varied considerably from campus to campus. The Board concluded that this variability detracted "from clearly and effectively communicating to students about the kind of preparation that is expected for baccalaureate degree programs." Furthermore, differences among university requirements continued to make it difficult for community colleges to establish comparable requirements, as required by statute. Thus, in November 1985, the Board of Higher Education adopted as policy a set of high school courses required for admission to baccalaureate degree programs at public universities and to baccalaureate-transfer degree programs at community colleges, effective with the freshman class entering in fall 1990. The specific high school course requirements set forth in this policy reflected the Board's earlier advice:

- 4 years of English (emphasizing written and oral communication and literature),
- 3 years of social studies (emphasizing history and government),
- 3 years of mathematics (introductory through advanced algebra, geometry, trigonometry, or fundamentals of computer programming),
- 3 years of science (laboratory sciences), and
- 2 years of electives in foreign language, music, or art.

The Board's resolution adopting these course-specific admission requirements also called on the public universities and community colleges to develop provisional admission policies to provide access to otherwise qualified students who did not meet these requirements and to establish partnership efforts with high schools in order to make the minimum requirements available in all schools so as to eventually eliminate the need to admit students provisionally. The resolution also called for the Board of Higher Education and the State Board of Education to establish a Joint Task Force on Admission Requirements and Learning Outcomes.

To provide more detailed guidance to high school students, the Joint Task Force on Admission Requirements and Learning Outcomes developed outcomes statements to describe what colleges and universities expected entering students to know and be able to do in the six subject areas identified in the Board's course-specific admission requirements: language arts (English), mathematics, biological and physical sciences, social studies, fine arts (music, art, theatre, and dance), and second (foreign) languages. These *Learning Outcomes for College-Bound Students* serve as guidelines for high schools in evaluating and improving their college-preparatory curricula, as guidelines for students and their parents in planning high school studies, and as the basis for a common understanding and continuing dialogue among high school, college, and university faculties on learning objectives.

During this same period, the Board received *A Background Report for the Study of Undergraduate Education in Illinois Colleges and Universities* (September 1985). This report summarized the findings from meetings with the faculties and administrations of 17 colleges and universities across the state. In addition to a continued concern about the preparation of students for collegiate work and the need for remediation in higher education, the report raised questions about college and university general education curricula, students' writing, reading, computation, and critical thinking skills, expectations for student achievement, the assessment of institutional effectiveness and of student progress, and the quality of undergraduate teaching. To address these issues, the Board appointed the Committee on the Study of Undergraduate Education in November.

The first issue addressed by the Committee on the Study of Undergraduate Education was provisional admission. In its deliberations, the Committee was concerned that the new admission requirements would deny access to some able students who did not complete the requirements through no fault of their own. Thus, the Committee's recommendations on student preparation and remediation called on colleges and universities to establish criteria for the provisional admission of "applicants who did not have an opportunity to complete the minimum college-preparatory coursework in high school...and educationally disadvantaged applicants who are admitted to organized special assistance programs that are tailored to [their] needs." In September 1986, the Board adopted as policy the Committee's 24 recommendations on student preparation and remediation, student achievement and scholarship and general education, and faculty and excellence in teaching. The policies on student preparation and remediation defined remediation as the basic skills in reading, writing, and mathematics essential to success in freshman coursework and reaffirmed the Board's policy that credit for remedial work would not apply toward college or university degrees.

In 1986, the General Assembly delayed implementation of the Board's course-specific admission requirements until fall 1993 in order to provide adequate time for all high schools in the state to be able to offer the required courses. Then, in December 1989, Public Act 86-0954 established the high school course-specific admission requirements by law. Public Act 86-0954 also, however, modified the

requirements originally adopted by the Board by introducing some flexibility for institutions in implementing the requirements, thus once again detracting from the consistent message the Board had intended to convey to students preparing for college. In addition, the Act incorporated the Board's policy on provisional admission as recommended by the Committee on the Study of Undergraduate Education. The text of Public Act 86-0954 is provided in Appendix A.

Finally, in Public Act 86-0986 adopted at the same time, the General Assembly addressed its concern that some high schools in the state would not offer the necessary courses by requiring the State Board of Education to certify that school districts in the state provide the coursework necessary to meet the admission requirements at public colleges and universities. By letter of January 3, 1992, State Superintendent Robert Leininger indicated to the Board of Higher Education that he was "pleased to certify that all high schools visited during the 1990-91 and the ongoing 1991-92 school year for the purpose of granting recognition are in compliance with Public Act 86-0986 and are offering the appropriate coursework necessary to meet admission requirements at public colleges and universities."

The July 1990 report, *Fall 1993 Admission Requirements at Public Universities*, presented details of each university's admission requirements in accordance with Public Act 86-0954. A follow-up report is planned for fall 1992 detailing the admission requirements, as well as alternative admission criteria, effective in fall 1993 at each public university and community college.

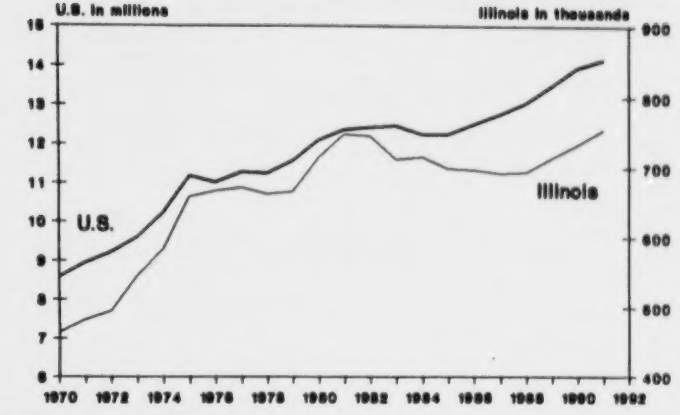
Trends in Access

As shown in Figure 1, trends in total higher education enrollment in Illinois parallel national trends. Total enrollment both nationally and in the state has increased by more than 60 percent over the past twenty years, with greater increases tending to occur during times of economic slowdown. This high level of enrollment growth suggests that access *per se* is not a problem in Illinois. Access to higher education, however, has several dimensions. Historically, access was viewed as the college-going rate of high school graduating seniors. More recently, discussions of access have focused on "non-traditional" students: students aged 25 or older and minority, women, and disabled students who historically have been underrepresented in higher education. Access has also been viewed from geographic and financial perspectives.

In the context of the high school course-specific admission requirements and policies on alternative admission criteria, this report focuses primarily on access to higher education by recent high school graduates and secondarily on access by non-traditional students. The January 1992 *Report to the Governor and General Assembly on Underrepresented Groups in Public Institutions of Higher Education in Illinois* provided more detailed information on the enrollment and degree completion of minority, women, and disabled students. The recommendations of the Committee to Study Underserved Areas, adopted as policy by the Board in January 1992, in part addressed geographic access, which, due to the comprehensive Illinois public community college system, is primarily a question of access to upper-division baccalaureate and graduate programs. In addition, the third report in this series on transfer and articulation, planned for May 1992, will further examine access by community college students to transfer into baccalaureate degree programs. Financial access is addressed through the Board's policies on tuition and student financial aid and, annually, through tuition and financial aid recommendations in the formulation of the state budget request.

As shown on Table 1, the number of Illinois graduating seniors declined by just under seven percent from 1986 to 1990. Although the number of graduates varied somewhat from year to year, the number of graduates is expected to continue to decline through the rest of the decade based on school census data. This overall decline reflects the aging of the Illinois population, as shown in Figure 2. There were fewer Illinoisans in the 18-to-24-year-old age group in 1990 than there were in 1980, while the number of Illinoisans aged 30 and over increased.

## Figure 1
## U.S. and Illinois Fall Enrollment Trends




Fall 1991 data are preliminary

## Figure 2
## Illinois Population, 1980 and 1990

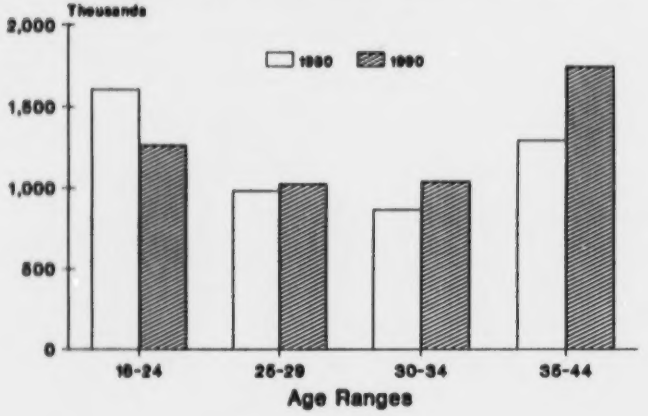



Table 1

**TRENDS IN ILLINOIS HIGH SCHOOL GRADUATES AND FIRST-TIME COLLEGE FRESHMEN**

| | 1986 | 1987 | 1988 | 1989 | 1990 | Percent Change |
|---|---|---|---|---|---|---|
| Number of Academic Year Illinois High School Graduates | 132,772 | 134,528 | 137,665 | 133,897 | 123,764 | (6.8)% |
| Number of Fall First-time Freshmen in Illinois Colleges/Universities | 89,051 | 90,699 | 93,198 | 92,974 | 92,268 | 3.6 % |
| Public Universities | 25,990 | 26,029 | 25,055 | 24,512 | 24,086 | (7.3) |
| Public Community Colleges | 39,637 | 40,243 | 43,450 | 44,763 | 45,514 | 14.8 |
| Private Multi-Purpose Institutions | 17,318 | 17,925 | 18,438 | 17,975 | 17,394 | 0.4 |
| Private Limited Purpose Institutions | 2,635 | 2,827 | 2,578 | 2,150 | 1,921 | (27.1) |
| Proprietary Institutions | 3,471 | 3,675 | 3,677 | 3,574 | 3,353 | (3.4) |

Sources: State Board of Education and IBHE Fall Enrollment Surveys

Table 1 also shows the number of first-time freshmen enrolled in Illinois colleges and universities. While the number of Illinois graduating seniors declined from 1986 through 1990, the number of first-time freshmen increased by 3.6 percent during this period. Although fall 1990 interstate migration data are not yet available, in prior years approximately eight percent of the first-time freshmen enrolled in Illinois institutions came from outside of Illinois, and approximately 15 percent of Illinois residents enrolled as first-time freshmen in out-of-state institutions.

The greatest increase in enrollment of first-time freshmen occurred in the public community colleges, at 14.8 percent. However, since more than half of community college undergraduates enrolled part-time and their mean age was 27.6 years, much of the enrollment gain was in non-traditional students rather than in recent high school graduates. Since the majority of public university and multi-purpose private institution undergraduates attend full-time, undergraduate enrollment in these institutions is more sensitive to changes in the number of high school graduates. More than half of the decline in first-time freshman enrollment in public universities, however, occurred at one university that initiated an enrollment management program to bring enrollment into line with resources. More than half of the decline in first-time freshmen enrolled in limited purpose institutions occurred at one college that closed one campus and opened another during this period. It should also be noted that the number of nonpublic institutions who admitted freshmen and who reported enrollment varied slightly from year to year.

These recent trends in the number of Illinois high school graduates and first-time college freshmen suggests that most Illinois residents who choose to enroll have access to higher education. Access to higher education, however, also depends on the prospective student's academic preparation for college work. The next section examines state and national data on the academic preparation of high school students.

## Student Preparation

The Board's policies on student preparation, access, and retention were designed to raise standards while at the same time maintaining access to higher education. The policies call on colleges and universities to improve the preparation of students by informing potential students and their parents and schools of what constitutes adequate academic preparation for college. In addition, the policies call on colleges and universities to establish policies and procedures for admitting students who do not meet requirements for regular admission in order to provide access to applicants who did not have an opportunity to complete a college-preparatory curriculum in high school and to educationally disadvantaged applicants. Most importantly, the policies call on colleges and universities to identify the academic needs of all admitted students through institutionally established assessment programs and to provide admitted students the remedial coursework identified as needed through the assessment process. The Committee on the Study of Undergraduate Education took the position that once an institution admitted a student, the institution is obligated to assist the student to succeed. The complete text of the Board's policies on student preparation, access, and retention is provided in Appendix B.

This section examines the current levels of academic achievement of Illinois high school students and the relationship between high school preparation and performance as college freshmen. National data on student achievement and performance are presented for comparison, when they were available. Finally, recent changes in levels of achievement and performance that may indicate a trend are noted.

### Elementary and Secondary School Student Achievement

Since 1969, the National Assessment of Educational Progress (NAEP) has periodically assessed students' achievement and proficiency in reading, writing, mathematics, science, history/geography, civics, and other subjects. The National Center for Education Statistics' (NCES) 1990 report on

student achievement in grades 4, 8, and 12 nationally (*America's Challenge: Accelerating Academic Achievement, A Summary of Findings from 20 Years of the NAEP*) shows that:

- Virtually all students can read at a surface level, getting the gist of the material, but very few can read analytically or perform well on challenging reading assignments.

- Students are familiar with events that shaped American history, but they do not appear to understand the significance of or connections between events.

- Despite progress in narrowing the gap, the differences in achievement between white and minority students remain unacceptably large, and little progress has been made in reducing gender gaps.

- In the 20 years of national assessments, little seems to have changed in how students are taught: classrooms still appear to be dominated by textbooks, lectures, and short-answer activity sheets despite research suggesting better alternatives.

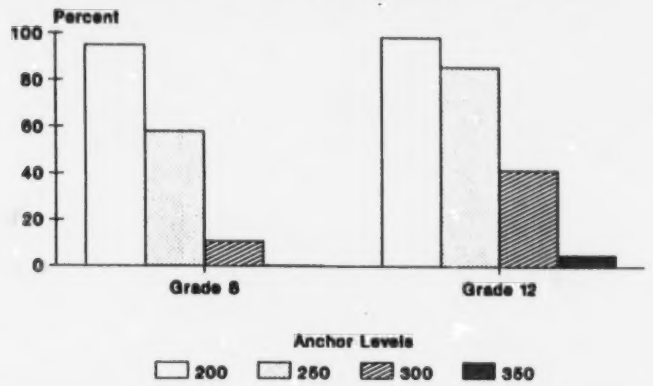
As shown in Figures 3 through 5, most high school seniors nationally have reached at least the intermediate proficiency level in reading, science, and mathematics. Less than half, however, are adept at summarizing and interpreting what they have read, analyzing scientific data, or solving algebraic equations. Even fewer seniors nationwide--between four and eight percent--can synthesize information from various sources, infer relationships, draw conclusions or generalizations, or solve multi-step mathematical problems.

For the 1990 mathematics assessment, individual states were invited to augment the national sample of eighth graders in order to provide meaningful information at the state level. Forty states, including Illinois, chose to do so, with results reported by NCES in June 1991 (*The State of Mathematics Achievement: NAEP's 1990 Assessment of the Nation and the Trial Assessment of the States*). As shown in Figure 5, the percentage of Illinois public school eighth graders achieving at each "anchor level" was at or slightly below the national average. More importantly, perhaps, the proportion of Illinois eighth graders scoring at the intermediate level (anchor level 250) was lower than the proportion in the other Central States, at 64 percent compared with 70 percent. Illinois students' overall average proficiency was significantly lower than students' proficiency in Iowa, Wisconsin, Nebraska, Minnesota, and North Dakota, but comparable to students in Indiana, Ohio, and Michigan (Missouri, Kansas, and South Dakota did not participate).

As a result of the Illinois School Reform Act of 1985, the State Board of Education established *State Goals for Learning* in six subject areas--language arts, mathematics, biological and physical sciences, social sciences, fine arts, and physical development and health--and began developing a statewide testing program to assess student achievement of these goals. Known collectively as the Illinois Goals Assessment Program (IGAP), scores on each subject test are reported on a scale from 1 to 500, with 250 established as the arithmetic mean and 181 and 318 representing one standard deviation below and above the mean, respectively. Deviations from the mean and standard range in future classes tested indicate progress or decline in achievement. The reading assessment was administered in grades 3, 6, and 8 beginning in spring 1988, with the assessment in grade 11 administered for the first time in 1990. The mathematics assessment began in grades 3, 6, and 8 in 1989, and the language arts assessment began in grades 3, 6, and 8 in 1990. The first science assessment is scheduled for April 1992.

Table 2 presents the 1990 results of the reading, mathematics, and language arts assessments for each grade level tested. For each test and grade level, the number of students tested, the mean score, and the mid-50 percent range of scores (representing one standard deviation below and above the mean) is provided for the state as a whole, for students in each of four racial/ethnic groups, and

## Figure 3
## National Reading Proficiency, 1988

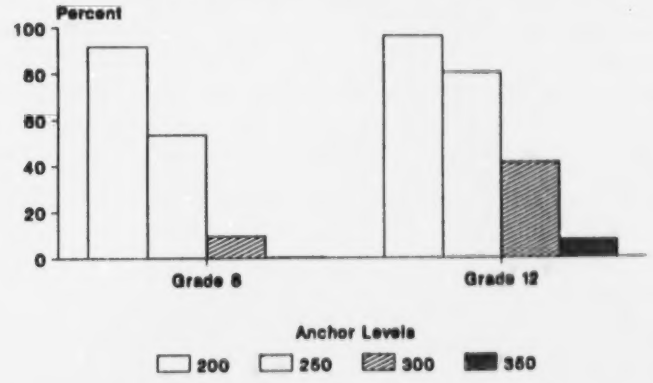



Source: National Assessment of Educational Progress, NCES

## National Assessment of Educational Progress
## Anchor Levels

| | |
|---|---|
| 150 | Rudimentary: Simple, discrete tasks, basic fact |
| 200 | Basic: Specific tasks, basic principles |
| 250 | Intermediate: Relate ideas, one-step problems |
| 300 | Adept: Evaluate ideas or procedures, equations |
| 350 | Advanced: Synthesize, infer, multi-step problems |

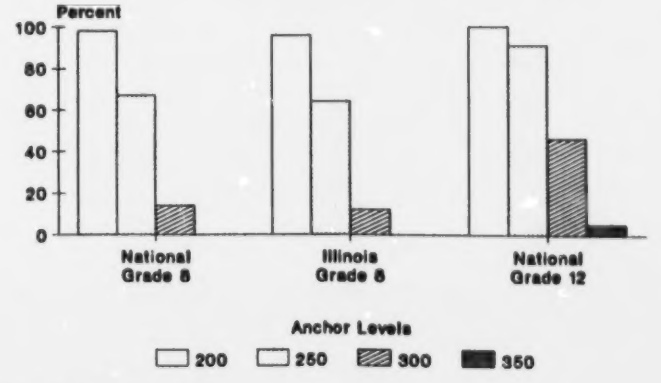
## Figure 4
## National Science Proficiency, 1986




Source: National Assessment of Educational Progress, NCES



## Figure 5
## Mathematics Proficiency, 1990




Source: National Assessment of Educational Progress, NCES

## Table 2
## ILLINOIS GOALS ASSESSMENT PROGRAM: 1990 SCORES

| Grade Level | Category | Reading | | | Mathematics | | | Language Arts | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | Number Tested | Mean Score | Mid-50 Percent Score Range | Number Tested | Mean Score | Mid-50 Percent Score Range | Number Tested | Mean Score | Mid-50 Percent Score Range |
| **Grade 3** | State Total | 118,275 | 257 | 186–326 | 119,430 | 249 | 164–317 | 116,260 | 250 | 181–318 |
| | Asian | 2,854 | 286 | 224–352 | 2,870 | 298 | 229–363 | 2,785 | 300 | 229–362 |
| | White | 79,052 | 279 | 215–344 | 79,393 | 273 | 206–337 | 78,097 | 273 | 208–334 |
| | Hispanic | 7,998 | 210 | 146–277 | 8,191 | 188 | 119–256 | 7,819 | 210 | 147–275 |
| | Black | 25,484 | 192 | 128–260 | 25,814 | 154 | 89–226 | 24,517 | 193 | 122–255 |
| | Male | 58,874 | 250 | 179–321 | 58,305 | 251 | 169–325 | 57,446 | 237 | 170–306 |
| | Female | 58,458 | 262 | 195–331 | 57,963 | 238 | 161–311 | 57,747 | 265 | 196–331 |
| **Grade 6** | State Total | 111,308 | 249 | 183–317 | 112,924 | 252 | 175–311 | 112,777 | 250 | 181–318 |
| | Asian | 2,867 | 289 | 223–352 | 2,898 | 308 | 241–374 | 2,885 | 303 | 232–367 |
| | White | 74,042 | 270 | 206–334 | 74,525 | 270 | 208–329 | 74,657 | 270 | 210–334 |
| | Hispanic | 9,631 | 203 | 146–265 | 9,828 | 194 | 136–256 | 9,751 | 210 | 147–278 |
| | Black | 22,407 | 189 | 133–256 | 23,075 | 173 | 116–232 | 23,001 | 187 | 122–260 |
| | Male | 54,368 | 247 | 181–317 | 54,191 | 251 | 178–319 | 55,093 | 237 | 167–306 |
| | Female | 56,498 | 252 | 186–321 | 56,135 | 240 | 174–305 | 57,176 | 265 | 199–331 |
| **Grade 8** | State Total | 106,595 | 254 | 183–319 | 107,225 | 248 | 167–312 | 107,029 | 250 | 181–318 |
| | Asian | 3,137 | 294 | 223–351 | 3,169 | 311 | 239–373 | 3,168 | 297 | 227–362 |
| | White | 70,811 | 277 | 212–339 | 70,921 | 269 | 204–330 | 70,982 | 270 | 208–338 |
| | Hispanic | 9,682 | 212 | 152–274 | 9,767 | 189 | 127–246 | 9,670 | 213 | 147–281 |
| | Black | 21,189 | 200 | 142–260 | 21,454 | 162 | 109–225 | 21,349 | 193 | 122–263 |
| | Male | 51,982 | 247 | 176–316 | 51,554 | 249 | 172–320 | 52,081 | 237 | 167–306 |
| | Female | 54,222 | 257 | 193–326 | 53,757 | 235 | 164–305 | 54,518 | 265 | 199–331 |
| **Grade 11** | State Total | 88,021 | 250 | 181–317 | | | | | | |
| | Asian | 3,164 | 277 | 201–354 | | | | | | |
| | White | 63,452 | 266 | 198–330 | | | | | | |
| | Hispanic | 5,424 | 210 | 147–272 | | | | | | |
| | Black | 13,969 | 195 | 139–254 | | | | | | |
| | Male | 42,371 | 243 | 174–313 | | | | | | |
| | Female | 45,131 | 254 | 190–320 | | | | | | |

Sources: Illinois State Board of Education: 1990 Reading State Report, Assessing Mathematics in Illinois 1990, and 1990 Language Arts State Report

by gender. The scores on the reading assessment show that the 1990 third and eighth graders read at a slightly higher level than did 1988 third and eighth graders, as reflected in slightly higher means and ranges, while 1990 and 1988 sixth graders read at essentially the same level. On the mathematics assessment, the 1990 mean score at each of the three grade levels is essentially the same as the 1989 mean score, but the 1990 mid-50 percent range of scores is lower than the 1989 range. In all three assessments and at each grade level, Asian students on average achieved higher scores than did white students who achieved higher scores than Hispanic students who achieved higher scores than Black students. Finally, as has been found consistently in other standardized testing programs, girls on average achieved higher scores in reading and language arts than did boys at each grade level, while boys achieved higher scores in mathematics than did girls at each grade level tested.

College Entrance Examinations

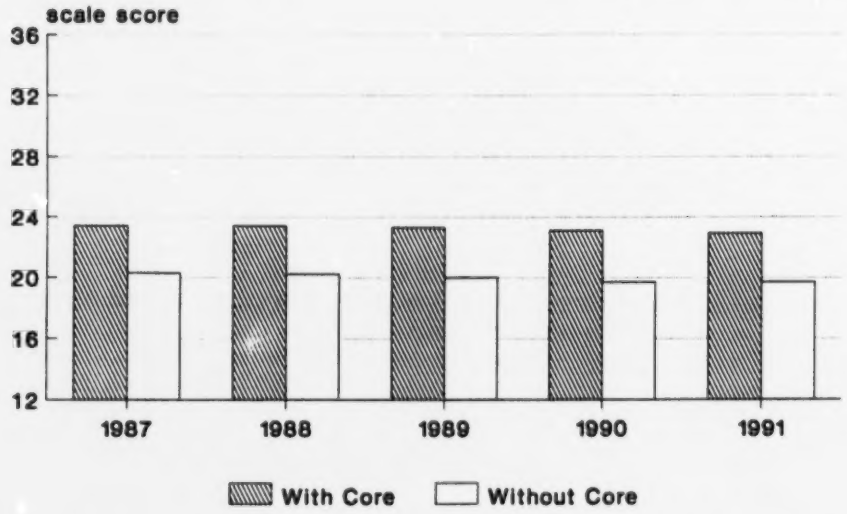
Another measure of the preparation of Illinois high school students for college is their scores on the American College Testing program's college entrance examination known as the ACT. Subsections of the test measure the student's achievement in English, mathematics, reading, and science reasoning, with a composite score calculated by adding and scaling the scores on these subsections. Scores are reported on a scale of 1 to 36, with 18 representing the arithmetic mean. In 1991, 73,541 (or approximately 60 percent) of the Illinois graduating seniors took the ACT, a decline of 11 percent from 1987.

As part of the ACT, generally taken in the fall of the senior year, test takers report the number of years of English, mathematics, science, social studies, and foreign language they will have completed by graduation. In a 1988 study, *Accuracy of Self-Reported High School Grades of College-Bound Students*, ACT found that the students' reports of courses taken and grades earned were 87 percent accurate as verified by information provided by their high schools. The number of Illinois test takers who reported taking the core high school curriculum--four years of English and three or more years each of mathematics, science, and social studies--increased by 65 percent in the past five years, from 16,481 in 1987 to 27,152 in 1991. Figure 6 shows there has been no significant change in the mean ACT composite score of Illinois test takers between 1987 and 1991. The figure also shows that in each year those students who reported taking the core curriculum in high school obtained a higher ACT composite score than students who did not. For the 1991 Illinois ACT test takers, the mean composite score for students who reported completing the core curriculum was 22.9 compared with a mean score of 19.7 for those who did not.

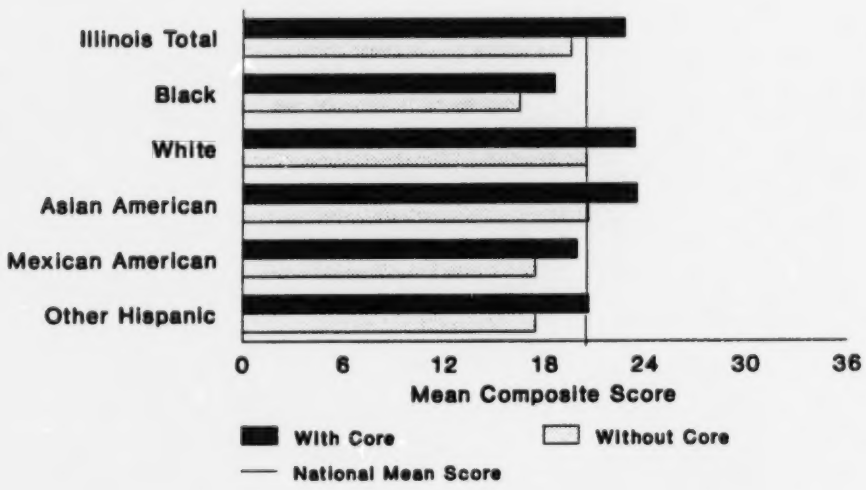
Figure 7 shows that this difference in mean composite score for students who reported taking the core curriculum in high school versus those who did not occurs for each racial/ethnic group within the 1991 Illinois test takers. For white students, those with the core had a mean composite score of 23.5 compared with 20.6 for those without the core. For Black students, those with the core had a mean composite score of 18.7 compared with 16.6 for those without the core curriculum in high school. Illinois' Mexican American students with the core had a mean composite score of 20.0, and all other Hispanic students with the core had a mean composite score of 20.7, with both groups of Hispanic students without the core having a mean score of 17.5. Although the mean scores differed among racial/ethnic groups, in each group the mean score of students reporting completion of the core curriculum not only exceeds the mean score of those who did not but also exceeds the arithmetic mean of 18.

The other major national college entrance examination is the Scholastic Aptitude Test (SAT) administered by the Educational Testing Service for the College Board. As its name implies, this test is designed to measure the aptitude of students for collegiate work rather than their achievement in specific high school subjects. Two scores are reported for each student: a verbal and a mathematics score, each with a range between 200 and 800 and an arithmetic mean of 500. The SAT was taken by only 18,210 (approximately 15 percent) of the 1991 Illinois high school seniors at some time during

## Figure 6
## Trends in Illinois ACT Composite Scores




## Figure 7
## 1991 Illinois ACT Composite by Race



their high school years, compared with the 73,541 Illinois high school students who took the ACT and with 26,110 who took the SAT in 1976.

The Illinois students who took the SAT were a more select group than both the national SAT test takers and the Illinois ACT test takers, with 52 percent of the 1991 Illinois SAT test takers in the top 20 percent of their graduating class compared with 42 percent of national test takers. Not surprisingly, the mean scores for Illinois SAT test takers were higher than the national means, with an Illinois SAT-Verbal mean of 471 compared with a national mean of 422 and an Illinois SAT-Math mean of 535 compared with a national mean of 474. Nevertheless, considering that more than half of the Illinois test takers ranked in the top 20 percent of their graduating class, the mean SAT-Verbal score is quite low. Figure 8 shows the mean Illinois SAT-Verbal and SAT-Math scores at five-year intervals between 1976 and 1991. While there has been no change in SAT-Verbal score over this period, the mean SAT-Math score has increased slightly, from 509 to 535. Figure 8 also shows that the mean verbal score for Illinois SAT test takers has consistently been lower than the mean math score.

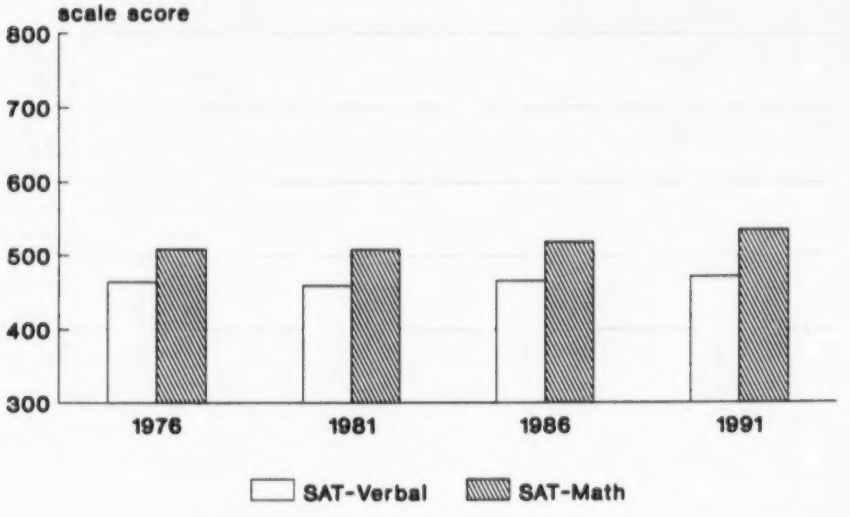
Designed to predict the probability of success in college, SAT scores, like ACT scores, show a strong correlation both nationally and in Illinois with high school rank, high school grades earned, and both the number and type of high school courses taken by subject area. In all cases, the higher the student's rank in class and high school grades and the more (and more advanced) academic courses taken, the higher the student's scores. For example, the SAT-Math mean for Illinois students who completed calculus was 636 compared with a mean of 532 for Illinois students who completed algebra. Figure 9 presents the 1991 SAT-Verbal mean scores for Illinois students by the number of years they enrolled in English and social science classes and the 1991 SAT-Math mean scores for Illinois students by the number of years they enrolled in mathematics and science classes in high school. Because mathematics and science disciplines are more structured and sequential than are English and the social sciences, the correlation between the number of years students reported studying a subject in high school and the mean score is greater for mathematics and science, although the correlation is positive in all cases. This relationship between number of years a subject was studied and the SAT score holds true for both minority and majority students and for both males and females.

Standardized Subject Matter Tests

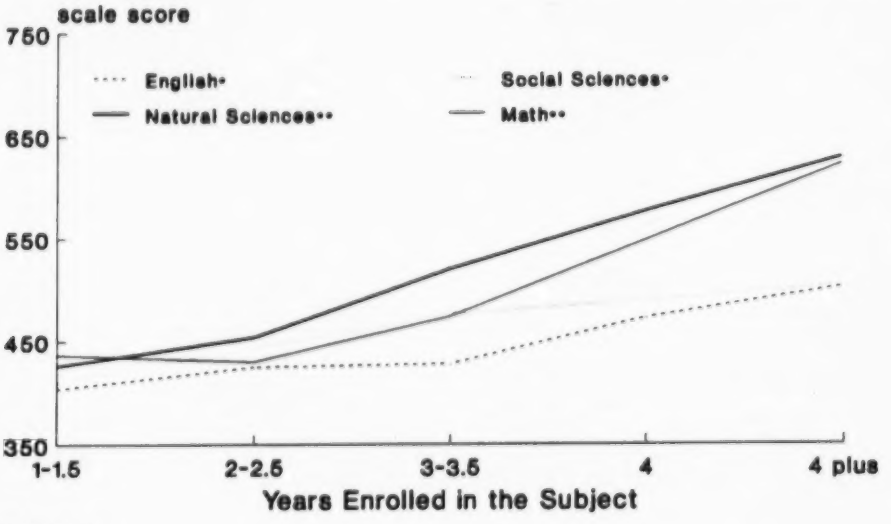
Two other nationally recognized tests measure high school student achievement in specific subjects. The SAT offers Achievement tests in 14 subjects, with scores reported on the same 200 to 800 point scale used in the SAT aptitude tests. In 1991, 3,275 Illinois students took an average of three Achievement tests each, as shown on Table 3. Since the Achievement tests are generally required for admission by only very selective colleges and universities nationally, students who take them tend to be high academic achievers in high school. Similarly, the Advanced Placement program makes college-level courses available in high schools to advanced students. Nationally developed course syllabi, teacher training seminars, and culminating course examinations are available in 29 specific subjects. In 1991, 364 Illinois high schools offered one or more Advanced Placement courses, and 15,010 Illinois students took between one and two examinations each, as is shown on Table 4. Scores of 1 through 5 are reported, with many colleges and universities granting either course credit or advanced standing in a subject to students scoring at level 3 or higher.

Illinois students' scores on the SAT Achievement and on the Advanced Placement tests show two interesting patterns. First, in general, these high achieving students scored better on tests in the quantitative and sequential subjects of mathematics and science than they did on tests in the verbal and interpretative subjects of languages, literature, and history. For example, the mean scores on three of the five mathematics and science Achievement tests were above 600 (with one above 700), while none of the mean scores on the nine language, literature, and history tests were above 600. On the Advanced Placement tests, only two of the mean scores on the eight mathematics and science tests

## Figure 8
## Trends in Illinois SAT Scores, 1976-1991




## Figure 9
## 1991 Illinois Mean SAT Scores by Subject




• SAT-Verbal
••SAT-Math

**Table 3**

**1991 ILLINOIS SAT ACHIEVEMENT TEST SCORES**

| | Number Tested | Mean Score | Percent 700-800 |
|---|---|---|---|
| English Comp | 3,036 | 569 | 8 % |
| Math II | 1,689 | 706 | 58 |
| Math I | 1,373 | 585 | 11 |
| Chemistry | 732 | 617 | 22 |
| American History | 725 | 590 | 13 |
| Spanish | 541 | 567 | 10 |
| Physics | 489 | 633 | 29 |
| French | 442 | 560 | 9 |
| Biology | 418 | 598 | 16 |
| Literature | 401 | 571 | 8 |
| European History | 68 | 582 | 12 |
| Latin | 64 | 547 | 6 |
| German | 55 | 586 | 13 |
| Modern Hebrew | 11 | 458 | 0 |
| Total Students | 3,275 | | |
| Total Tests | 10,044 | 599 | 11 |

Source: 1991 Profile of SAT and
Achievement Test Takers, Illinois Report

**Table 4**

**1991 ILLINOIS ADVANCED PLACEMENT TEST SCORES**
(Top 15 of 29 Tests)

| | Number Tested | Mean Score | Percent 3-5 |
|---|---|---|---|
| U.S. History | 4,130 | 2.89 | 58.5 % |
| English Lit/Comp | 4,002 | 3.12 | 71.2 |
| Math/Calculus AB | 3,066 | 3.05 | 68.8 |
| Biology | 1,561 | 3.24 | 69.6 |
| English Lang/Comp | 1,466 | 2.92 | 62.3 |
| European History | 1,379 | 3.21 | 77.4 |
| Chemistry | 1,376 | 3.24 | 72.5 |
| Math/Calculus BC | 1,336 | 3.64 | 82.3 |
| Spanish Language | 905 | 3.49 | 80.1 |
| U.S. Govt/Politics | 644 | 3.24 | 78.3 |
| Physics B | 522 | 2.90 | 65.3 |
| French Language | 501 | 2.94 | 64.3 |
| Physics C/Mechanics | 488 | 3.77 | 86.1 |
| Computer Sci A | 459 | 2.96 | 58.0 |
| Physics C/Elect | 411 | 3.69 | 79.6 |
| Total Students | 15,010 | | |
| Total Tests | 24,290 | 3.14 | |

Source: 1991 Advanced Placement Program

were below 3, while three of the mean scores on the six language, literature, and history tests were below 3. Second, the more advanced the mathematics or science subject, the higher were the average scores, although fewer students took the more advanced subject tests. For example, the mean score on the level II mathematics Achievement test was 706, with 58 percent of the test takers scoring above 700, while the mean score on the level I test was 585, with only 11 percent scoring above 700. Similarly, in the Advanced Placement tests, the mean score on the Calculus BC test was 3.64, with 82 percent scoring 3 or higher, while the mean score on the Calculus AB test was 3.05, with 69 percent scoring 3 or higher. This same relationship holds true for the two Physics C tests compared with the Physics B test.

Remediation in Higher Education

According to data gathered by the National Center for Education Statistics (NCES), in fall 1989, 30 percent of U.S. college freshmen enrolled in at least one remedial course, with more than one out of five students taking remedial mathematics. Three out of four colleges and universities offered at least one remedial course. The Center's report, *College-Level Remedial Education in the Fall of 1989* (May 1991), also indicated that 40 percent of the colleges and universities offering remediation were not engaged in any activities to reduce the need for it. In *Responding to Student Diversity* (1990), Richard C. Richardson, Jr., reported that the proportion of students in need of remediation is higher in community colleges, with more than half of the students entering community colleges nationwide lacking the basic skills required to succeed in collegiate coursework.

As was described in the report, *Undergraduate Education: Learning and Teaching*, both public universities and community colleges assess students' basic writing and mathematics skills at entry in order to place students into appropriate initial courses. The public universities, who require the submission of ACT (or equivalent) scores for admission, often administer additional tests only to those students whose scores are below specified levels on the relevant ACT sub-tests. Since few community college students have taken the ACT, community colleges usually test all incoming full-time students and any part-time student who intends to register for an English or math course. Results of these entry assessments are used to place students into remedial or freshman-level English composition and mathematics courses. Board of Higher Education policy recognizes that in Illinois the public community colleges have the primary responsibility for remediation.

Table 5 shows the number of credit hours generated in remedial reading, writing, and mathematics in Illinois public community colleges from fiscal year 1986 through fiscal year 1991. Although the number of remedial credit hours varied by subject from year to year, the overall number of remedial credit hours increased by 32 percent during this period. Nearly twice as many credit hours were generated in remedial mathematics than were generated in remedial reading. Although the number of remedial credit hours generated in fiscal year 1991 represents more than 10,000 full-time equivalent students, remedial credit hours accounted for only five percent of the total community college credit hours generated in fiscal year 1991.

Table 6 shows that the number of students enrolled exclusively in remedial work in public universities and nonpublic institutions in Illinois is very small. The fall 1990 high figure for exclusively remedial enrollment in public universities, at 212 students, represents less than one percent of the public universities' first-time freshman enrollment. The proportion of students enrolled exclusively in remedial coursework in nonpublic institutions, which varied from year to year, is even lower.

Freshman Performance

As a result of the original policies on undergraduate education adopted in September 1986, the public universities jointly developed a High School Feedback System to report to each Illinois high

Table 5

**TRENDS IN REMEDIATION IN ILLINOIS PUBLIC COMMUNITY COLLEGES:**
**CREDIT HOURS GENERATED BY SUBJECT AREA**

| | FY1986 | FY1987 | FY1988 | FY1989 | FY1990 | FY1991 | Percent Change |
|---|---|---|---|---|---|---|---|
| Reading | 51,213 | 54,407 | 47,809 | 49,410 | 64,437 | 69,394 | 35.5 % |
| Writing | 86,932 | 90,402 | 83,587 | 85,204 | 105,665 | 110,647 | 27.3 |
| Mathematics | 96,611 | 104,097 | 97,827 | 94,711 | 116,700 | 130,756 | 35.3 |
| Total Remedial Credit Hours | 234,756 | 248,906 | 229,223 | 229,325 | 286,802 | 310,797 | 32.4 % |
| Full-time Equivalent Students | 7,825 | 8,297 | 7,641 | 7,644 | 9,560 | 10,360 | 32.4 |

Source: Illinois Community College Board Unit Cost Studies

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Table 6

**TRENDS IN REMEDIATION IN ILLINOIS HIGHER EDUCATION:**
**NUMBER ENROLLED EXCLUSIVELY IN REMEDIAL COURSEWORK BY SECTOR**

| | Fall 1986 | Fall 1987 | Fall 1988 | Fall 1989 | Fall 1990 |
|---|---|---|---|---|---|
| Public Universities | 39 | 150 | 170 | 173 | 212 |
| Private Multi-Purpose Institutions* | 23 | 44 | 65 | 91 | 43 |
| Private Limited-Purpose Institutions* | 14 | 0 | 0 | 20 | 16 |
| Proprietary Institutions* | 1 | 141 | 0 | 0 | 0 |

*The number of private institutions admitting freshmen varied from year to year:
The number of multi-purpose private institutions declined from 55 in 1986 to 53 in 1990,
the number of limited purpose institutions declined from 19 in 1986 to 17 in 1990,
and the number of proprietary institutions varied from 16 to 19, with 17 in 1990.

Source: IBHE Fall Enrollment Surveys

school the first-term performance of the high school's recent graduates. The first report in 1989 provided information on the performance of first-time freshmen entering the ten public universities that admit freshmen in fall 1988. The annual reports in 1990 and 1991 added the next two entry classes. Since the purpose of the system was to provide information that would be useful to the high school in improving its college-preparatory curriculum, the report includes information on individual student enrollment in English, mathematics, and science courses by level (remedial, regular freshman, and advanced), as well as grades earned in the courses taken during their first term. Individual community colleges provide similar information on recent graduates to high schools within their districts. The community college high school feedback data, however, are not available for aggregation statewide.

Table 7 presents information from the public universities' High School Feedback System on first-term English, mathematics, and science course enrollment of 69,217 freshmen who entered public universities in summer and fall 1988, 1989, and 1990. The table shows that a sizable proportion of entering freshmen did not enroll in an English, mathematics, or science course during their first term: 32 percent did not enroll in an English course, 37 percent did not enroll in a mathematics course, and 57 percent did not enroll in a science course. Larger campuses, such as the University of Illinois at Urbana-Champaign and Southern Illinois University at Carbondale, attempt to balance instructor course loads by assigning half of the entering students to freshman English courses the first semester and the other half the second semester. Beginning with fall 1991, the High School Feedback System will report enrollment and performance for the full first year rather than only the first term.

**Table 7**

**FIRST-TIME FRESHMAN[1] ENGLISH, MATHEMATICS, AND SCIENCE COURSE ENROLLMENT**

| First-Term Enrollment | English | Mathematics | Science |
|---|---|---|---|
| Enrolled at Remedial Level | 4,848 | 8,904 | NA |
| Enrolled at Freshman Level | 40,455 | 27,777 | 27,749 |
| Enrolled at Advanced Level | 1,844 | 7,130 | 2,343 |
| Total Enrolled by Subject | 47,147 | 43,811 | 30,092 |
| Total Not Enrolled by Subject | 22,070 | 25,406 | 39,125 |
| Total First-time Freshmen | 69,217 | 69,217 | 69,217 |

[1] Based on first-time freshmen enrolling in public universities in summer and fall 1988, 1989, and 1990.

Source: Public Universities' High School Feedback System

Table 7 also shows that only a small proportion of first-time freshmen enrolled in remedial coursework their first term: seven percent enrolled in remedial English (composition), and 13 percent enrolled in remedial mathematics. Similarly, however, the table shows that an even smaller proportion enrolled in advanced coursework in these subjects: three percent each enrolled in advanced English and science courses, and 10 percent enrolled in advanced mathematics courses.

Tables 8, 9, and 10 show the performance of those students who enrolled in English, mathematics, and science courses their first term by the number of years of each subject they completed in high school. Table 8 shows that, of the 47,147 students who enrolled in English the first term, 84 percent had completed the recommended four years of high school English, and 9 percent had not. High school English course completion information for 11 percent of the freshmen was "unknown."[1] Freshmen whose high school English record was unknown were the most likely to have enrolled in a remedial English course, at 24 percent, compared with 10 percent of those who completed four years of English in high school and five percent of those who completed less than four years of English in high school. The apparent inverse relationship between the number of years of English completed in high school and enrollment in remedial versus regular freshman English courses suggests that the "number of years" designation by itself is insufficient without taking into account the qualifying statements in the admission requirements. In other words, if the four years of high school English did not emphasize written and oral communication and literature, then the prospective student is unlikely to be adequately prepared for freshman-level English coursework. In addition, the student's grades in the courses completed, the academic standards of the high school attended, and even variations among teachers influence the quality of the student's preparation for college.

Those freshmen who completed four years of English in high school, however, were more likely to earn As and Bs and less likely to perform unsatisfactorily in English courses at each of the three levels than were freshmen who had not completed four years of English in high school. Overall, the performance of first-term freshmen in English courses was high, with nearly three out of five earning As and Bs and less than one out of ten receiving a failing grade.

Table 9 shows that, of the 43,811 freshmen enrolled in a mathematics course their first term, 82 percent completed the recommended three-years (or more) of mathematics in high school, while 11 percent completed less than three years, and the high school mathematics record for 6 percent was unknown. Students who completed less than three years of mathematics in high school were the most likely to enroll in remedial mathematics (34 percent) and least likely to enroll in advanced mathematics courses (5 percent)[2]. The fact that 18 percent of those who completed three years of mathematics in high school enrolled in remedial mathematics suggests, again, that the number of years taken alone provides insufficient information since it does not account for the level of the courses taken. The high level of remedial enrollment among those who completed three or more years of mathematics in high school coupled with the fact that 33 percent of those whose high school mathematics course record was unknown enrolled in advanced mathematics courses affirms that public universities assess the entry-level skills of students for course-placement purposes, as was indicated in *Undergraduate Education: Learning and Teaching.*

As was true in English, the freshmen who completed at least three years of mathematics in high school were more likely to earn As and Bs in mathematics their first term and less likely to perform unsatisfactorily than those who did not. Overall, first-term freshman performance in mathematics courses was lower than their performance in English, with two out of five earning As or Bs, and one out of five receiving a failing grade in the mathematics course taken.

Table 10 shows that, of the 30,092 students who enrolled in a science course their first term, 69 percent completed the recommended three (or more) years of high school science, while 25 percent had not, and the high school science record of six percent was unknown. The science enrollment pattern for those students with and without three years of high school science was exactly the same:

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[1] The primary source of high school course data was the ACT report. If a student did not respond on the ACT or did not take the ACT, as is the case with foreign students and students who substituted SAT scores, then these data are not in the High School Feedback System file.

[2] Each university identified the individual courses it classified at each level. The most dissimilar classification occurs in mathematics. In the interim between the adoption of the course-specific admission requirements and their implementation in fall 1993, six of the ten universities classified intermediate algebra as a freshman course, rather than as a remedial course, for students who did not complete it in high school. The public universities are currently in process of reclassifying all courses.

**Table 8**

**FIRST-TIME FRESHMAN[1] ENGLISH COURSE ENROLLMENT AND ACHIEVEMENT AT ILLINOIS PUBLIC UNIVERSITIES**

| | Enrolled in Remedial English | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | Took 4 Years of High School English | | Less Than 4 Years H.S. English | | Unknown | | Total | |
| Course Grade | N | % | N | % | N | % | N | % |
| A or B | 1,573 | 41.0 | 44 | 21.0 | 17 | 2.1 | 1,634 | 33.7 |
| Satisfactory/Other | 2,042 | 53.3 | 147 | 70.0 | 787 | 97.8 | 2,976 | 61.4 |
| Unsatisfactory | 218 | 5.7 | 19 | 9.0 | 1 | 0.1 | 238 | 4.9 |
| Total | 3,833 | 100.0 | 210 | 100.0 | 805 | 100.0 | 4,848 | 100.0 |

| | Enrolled in Freshman English | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | Took 4 Years of High School English | | Less Than 4 Years H.S. English | | Unknown | | Total | |
| Course Grade | N | % | N | % | N | % | N | % |
| A or B | 20,796 | 60.9 | 1,781 | 45.5 | 1,262 | 52.7 | 23,839 | 58.9 |
| Satisfactory/Other | 10,958 | 32.1 | 1,700 | 43.4 | 922 | 38.5 | 13,580 | 33.6 |
| Unsatisfactory | 2,389 | 7.0 | 436 | 11.1 | 211 | 8.8 | 3,036 | 7.5 |
| Total | 34,143 | 100.0 | 3,917 | 100.0 | 2,395 | 100.0 | 40,455 | 100.0 |

| | Enrolled in Advanced English | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | Took 4 Years of High School English | | Less Than 4 Years H.S. English | | Unknown | | Total | |
| Course Grade | N | % | N | % | N | % | N | % |
| A or B | 1,218 | 75.1 | 84 | 62.7 | 68 | 77.3 | 1,370 | 74.3 |
| Satisfactory/Other | 322 | 19.9 | 39 | 29.1 | 16 | 18.2 | 377 | 20.4 |
| Unsatisfactory | 82 | 5.1 | 11 | 8.2 | 4 | 4.5 | 97 | 5.3 |
| Total | 1,622 | 100.0 | 134 | 100.0 | 88 | 100.0 | 1,844 | 100.0 |

| | Enrolled in All Levels of English | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | Took 4 Years of High School English | | Less Than 4 Years H.S. English | | Unknown | | Total | |
| Course Grade | N | % | N | % | N | % | N | % |
| A or B | 23,587 | 59.6 | 1,909 | 44.8 | 1,347 | 41.0 | 26,843 | 56.9 |
| Satisfactory/Other | 13,322 | 33.6 | 1,886 | 44.3 | 1,725 | 52.5 | 16,933 | 35.9 |
| Unsatisfactory | 2,689 | 6.8 | 466 | 10.9 | 216 | 6.6 | 3,371 | 7.1 |
| Total | 39,598 | 100.0 | 4,261 | 100.0 | 3,288 | 100.0 | 47,147 | 100.0 |

[1] Based on first-time freshmen enrolling at public universities in summer and fall terms of 1988, 1989, and 1990.

Source: Public Universities' High School Feedback System

**Table 9**

**FIRST-TIME FRESHMAN[1] MATHEMATICS COURSE ENROLLMENT AND ACHIEVEMENT AT ILLINOIS PUBLIC UNIVERSITIES**

| | Enrolled in Remedial Mathematics | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | Took 3 Years of High School Mathematics | | Less Than 3 Years H.S. Mathematics | | Unknown | | Total | |
| Course Grade | N | % | N | % | N | % | N | % |
| A or B | 1,985 | 30.4 | 289 | 16.9 | 6 | 0.9 | 2,280 | 25.6 |
| Satisfactory/Other | 3,181 | 48.7 | 970 | 56.7 | 604 | 91.0 | 4,755 | 53.4 |
| Unsatisfactory | 1,362 | 20.9 | 453 | 26.5 | 54 | 8.1 | 1,869 | 21.0 |
| Total | 6,528 | 100.0 | 1,712 | 100.0 | 664 | 100.0 | 8,904 | 100.0 |

| | Enrolled in Freshman Mathematics | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | Took 3 Years of High School Mathematics | | Less Than 3 Years H.S. Mathematics | | Unknown | | Total | |
| Course Grade | N | % | N | % | N | % | N | % |
| A or B | 9,635 | 40.9 | 873 | 28.5 | 412 | 35.7 | 10,920 | 39.3 |
| Satisfactory/Other | 9,076 | 38.5 | 1,507 | 49.2 | 461 | 39.9 | 11,044 | 39.8 |
| Unsatisfactory | 4,849 | 20.6 | 682 | 22.3 | 282 | 24.4 | 5,813 | 20.9 |
| Total | 23,560 | 100.0 | 3,062 | 100.0 | 1,155 | 100.0 | 27,777 | 100.0 |

| | Enrolled in Advanced Mathematics | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | Took 3 Years of High School Mathematics | | Less Than 3 Years H.S. Mathematics | | Unknown | | Total | |
| Course Grade | N | % | N | % | N | % | N | % |
| A or B | 3,209 | 53.6 | 99 | 42.3 | 375 | 41.4 | 3,683 | 51.7 |
| Satisfactory/Other | 2,047 | 34.2 | 91 | 38.9 | 386 | 42.7 | 2,524 | 35.4 |
| Unsatisfactory | 735 | 12.3 | 44 | 18.8 | 144 | 15.9 | 923 | 12.9 |
| Total | 5,991 | 100.0 | 234 | 100.0 | 905 | 100.0 | 7,130 | 100.0 |

| | Enrolled in All Levels of Mathematics | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | Took 3 Years of High School Mathematics | | Less Than 3 Years H.S. Mathematics | | Unknown | | Total | |
| Course Grade | N | % | N | % | N | % | N | % |
| A or B | 14,829 | 41.1 | 1,261 | 25.2 | 793 | 29.1 | 16,883 | 38.5 |
| Satisfactory/Other | 14,304 | 39.6 | 2,568 | 51.3 | 1,451 | 53.3 | 18,323 | 41.8 |
| Unsatisfactory | 6,946 | 19.3 | 1,179 | 23.5 | 480 | 17.6 | 8,605 | 19.6 |
| Total | 36,079 | 100.0 | 5,008 | 100.0 | 2,724 | 100.0 | 43,811 | 100.0 |

[1] Based on first-time freshmen enrolling at public universities in summer and fall terms of 1988, 1989, and 1990.

Source: Public Universities' High School Feedback System

## Table 10

## FIRST-TIME FRESHMAN[1] SCIENCE COURSE ENROLLMENT AND ACHIEVEMENT AT ILLINOIS PUBLIC UNIVERSITIES

| Course Grade | Enrolled in Freshman Science | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | Took 3 Years of High School Science | | Less Than 3 Years H.S. Science | | Unknown | | Total | |
| | N | % | N | % | N | % | N | % |
| A or B | 8,595 | 44.4 | 2,396 | 35.0 | 598 | 38.5 | 11,589 | 41.8 |
| Satisfactory/Other | 7,571 | 39.0 | 2,923 | 42.7 | 562 | 36.2 | 11,036 | 39.8 |
| Unsatisfactory | 3,201 | 16.5 | 1,531 | 22.4 | 392 | 25.3 | 5,124 | 18.5 |
| Total | 19,347 | 100.0 | 6,850 | 100.0 | 1,552 | 100.0 | 27,749 | 100.0 |

| Course Grade | Enrolled in Advanced Science | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | Took 3 Years of High School Science | | Less Than 3 Years H.S. Science | | Unknown | | Total | |
| | N | % | N | % | N | % | N | % |
| A or B | 675 | 43.6 | 195 | 35.5 | 89 | 36.0 | 959 | 40.9 |
| Satisfactory/Other | 526 | 34.0 | 196 | 35.7 | 91 | 36.8 | 813 | 34.7 |
| Unsatisfactory | 346 | 22.4 | 158 | 28.8 | 67 | 27.1 | 571 | 24.4 |
| Total | 1,547 | 100.0 | 549 | 100.0 | 247 | 100.0 | 2,343 | 100.0 |

| Course Grade | Enrolled in All Levels of Science | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | Took 3 Years of High School Science | | Less Than 3 Years H.S. Science | | Unknown | | Total | |
| | N | % | N | % | N | % | N | % |
| A or B | 9,270 | 44.4 | 2,591 | 35.0 | 687 | 38.2 | 12,548 | 41.7 |
| Satisfactory/Other | 8,077 | 38.7 | 3,119 | 42.2 | 653 | 36.3 | 11,849 | 39.4 |
| Unsatisfactory | 3,547 | 17.0 | 1,689 | 22.8 | 459 | 25.5 | 5,695 | 18.9 |
| Total | 20,894 | 100.0 | 7,399 | 100.0 | 1,799 | 100.0 | 30,092 | 100.0 |

[1] Based on first-time freshmen enrolling at public universities in summer and fall terms of 1988, 1989, and 1990.

Source: Public Universities' High School Feedback System

93 percent enrolled in a freshman-level science course, and 7 percent enrolled in an advanced science course. (By definition, there are no remedial science courses.) Once again, however, freshmen who completed three (or more) years of high school science were more likely to earn As and Bs and less likely to perform unsatisfactorily in their college science courses than were those who completed less than three years of high school science. Overall, the first-term freshman performance in science courses was similar to first-term mathematics performance: two out of five students earned As or Bs, and one out of five received a failing grade.

Together, these tables indicate that the majority of public university first-time freshmen in summer and fall 1988, 1989, and 1990 met the high school course-specific admission requirements in English, mathematics, and science that become effective statewide in fall 1993. More entering students completed the requirements in English and mathematics than met the requirement in science. Fully 37,023 entering students met the requirements in all three subject areas, with only 2,995 not meeting requirements in any of the three subjects. The high school course status of 5,090 entering students was unknown, while the remaining students (24,109) met some requirements but not others.

Relationships Among ACT, High School Percentile Rank, and College Performance

Earlier in this section, several tables illustrated the relationship between the student's ACT score and whether or not the student completed the core college-preparatory curriculum in high school. These data from the High School Feedback System have suggested that, while the number of years a subject was taken in high school is related to college performance, the level of the courses taken and the grades earned in them are also related to performance in college. A student's high school percentile rank (HSPR) can serve as a proxy for high school grades earned. The High School Feedback System contains the ACT composite score and high school percentile rank for each entering freshman. Overall, 50 percent of the 69,217 freshmen entering public universities in 1988 through 1990 graduated in the top quarter of their class, with 24 percent graduating within the top 10 percent of their high school class. (High school percentile rank was not available for 2,043 freshmen.)

Table 11 displays the mean ACT composite score and high school percentile rank for the first-time freshmen by level of college English, mathematics, and science course enrollment. As the table shows, the mean ACT composite score and high school rank for freshmen enrolled in remedial coursework are significantly lower than the class average and than the mean score and rank of those enrolling in freshman-level courses. Conversely, the mean ACT composite score and high school rank for freshmen enrolled in advanced courses are significantly above the average for the class as a whole.

Table 11 also shows that both the mean score and rank for those students not enrolled in an English course their first term are above average, attesting to the arbitrary assignments for first-term English registration at some universities. Freshmen who did not enroll in mathematics and science their first term, however, have a mean ACT composite score and a mean high school percentile rank below the class average, suggesting that these students may be avoiding taking courses in mathematics and science.

Tables 12, 13, and 14 present mean ACT composite scores and high school percentile rank by first-term enrollment and performance in English, mathematics, and science courses, respectively. Each table shows a strong positive correlation between both the mean ACT composite score and high school rank and first-term freshman performance. The relationship is stronger in mathematics and science than it is in English. This differential relationship for mathematics/science and English was also seen earlier in the discussion of SAT, SAT-Achievement, and Advanced Placement scores compared with courses taken in high school. The few exceptions to this strong positive correlation that are seen in Tables 12, 13, and 14 suggest that the motivation of individual students is an important variable in successful academic performance.

Table 11

**MEAN ACT COMPOSITE SCORE AND HIGH SCHOOL PERCENTILE RANK OF FIRST-TIME FRESHMEN[1] BY LEVEL OF ENGLISH, MATHEMATICS, AND SCIENCE COURSE ENROLLMENT**

| | English | | Mathematics | | Science | |
|---|---|---|---|---|---|---|
| | ACT | HSPR | ACT | HSPR | ACT | HSPR |
| Enrolled at Remedial Level | 16.2 | 64.4 | 18.6 | 64.7 | NA | NA |
| Enrolled at Freshman Level | 21.3 | 69.1 | 22.1 | 74.3 | 22.5 | 73.6 |
| Enrolled at Advanced Level | 24.2 | 80.2 | 25.7 | 84.0 | 23.9 | 77.0 |
| Total Enrolled | 20.9 | 69.1 | 22.0 | 74.0 | 22.6 | 73.8 |
| Not Enrolled in These Subjects First Term of Freshman Year | 22.9 | 75.2 | 20.5 | 65.8 | 20.6 | 68.9 |
| Total First-time Freshmen | 21.5 | 71.0 | 21.5 | 71.0 | 21.5 | 71.0 |

1 Based on first-time freshmen enrolling at public universities in summer and fall terms of 1988, 1989, and 1990.

Source: Public Universities' High School Feedback System

**Table 12**

**MEAN ACT COMPOSITE SCORE AND HIGH SCHOOL PERCENTILE RANK OF FIRST-TIME FRESHMEN[1] BY ENGLISH COURSE ENROLLMENT AND ACHIEVEMENT AT ILLINOIS PUBLIC UNIVERSITIES**

Enrolled in Remedial English

| Course Grade | Took 4 Years of High School English | | Less Than 4 Years H.S. English | | Unknown | | Total | |
|---|---|---|---|---|---|---|---|---|
| | ACT | HSPR | ACT | HSPR | ACT | HSPR | ACT | HSPR |
| A or B | 17.4 | 68.3 | 16.3 | 66.6 | 22.0 | NA | 17.4 | 68.2 |
| Satisfactory/Other | 15.4 | 64.2 | 14.3 | 58.6 | 15.5 | 59.5 | 15.4 | 62.7 |
| Unsatisfactory | 16.7 | 59.2 | 12.7 | 59.1 | NA | NA | 16.4 | 59.2 |
| Total | 16.3 | 65.6 | 14.6 | 60.3 | 15.6 | 59.5 | 16.2 | 64.4 |

Enrolled in Freshman English

| Course Grade | Took 4 Years of High School English | | Less Than 4 Years H.S. English | | Unknown | | Total | |
|---|---|---|---|---|---|---|---|---|
| | ACT | HSPR | ACT | HSPR | ACT | HSPR | ACT | HSPR |
| A or B | 22.6 | 75.6 | 21.1 | 68.7 | 21.1 | 66.5 | 22.4 | 74.6 |
| Satisfactory/Other | 19.8 | 63.9 | 18.4 | 58.9 | 19.7 | 56.7 | 19.6 | 62.8 |
| Unsatisfactory | 19.9 | 55.5 | 19.0 | 50.7 | 19.8 | 44.2 | 19.8 | 54.1 |
| Total | 21.5 | 70.4 | 19.7 | 62.4 | 20.4 | 60.7 | 21.3 | 69.1 |

Enrolled in Advanced English

| Course Grade | Took 4 Years of High School English | | Less Than 4 Years H.S. English | | Unknown | | Total | |
|---|---|---|---|---|---|---|---|---|
| | ACT | HSPR | ACT | HSPR | ACT | HSPR | ACT | HSPR |
| A or B | 24.8 | 83.3 | 23.3 | 77.5 | 25.7 | 81.1 | 24.7 | 82.8 |
| Satisfactory/Other | 22.8 | 74.9 | 20.3 | 66.8 | 22.9 | 68.9 | 22.5 | 73.8 |
| Unsatisfactory | 23.2 | 68.7 | 21.0 | 71.0 | 24.8 | 41.0 | 23.1 | 67.8 |
| Total | 24.3 | 80.9 | 22.3 | 73.8 | 25.2 | 77.0 | 24.2 | 80.2 |

Enrolled in All Levels of English

| Course Grade | Took 4 Years of High School English | | Less Than 4 Years H.S. English | | Unknown | | Total | |
|---|---|---|---|---|---|---|---|---|
| | ACT | HSPR | ACT | HSPR | ACT | HSPR | ACT | HSPR |
| A or B | 22.3 | 75.5 | 21.1 | 69.0 | 21.3 | 67.3 | 22.2 | 74.7 |
| Satisfactory/Other | 19.2 | 64.2 | 18.1 | 59.1 | 17.9 | 58.1 | 19.0 | 63.0 |
| Unsatisfactory | 19.8 | 56.2 | 18.8 | 51.5 | 19.9 | 44.1 | 19.7 | 54.8 |
| Total | 21.1 | 70.4 | 19.5 | 62.7 | 19.5 | 60.9 | 20.9 | 69.1 |

[1] Based on first-time freshmen enrolling at public universities in summer and fall terms of 1988, 1989, and 1990.

Source: Public Universities' High School Feedback System

**Table 13**

**MEAN ACT COMPOSITE SCORE AND HIGH SCHOOL PERCENTILE RANK OF FIRST-TIME FRESHMEN[1] BY MATHEMATICS COURSE ENROLLMENT AND ACHIEVEMENT AT ILLINOIS PUBLIC UNIVERSITIES**

Enrolled in Remedial Mathematics

| Course Grade | Took 3 Years of High School Mathematics | | Less Than 3 Years H.S. Mathematics | | Unknown | | Total | |
|---|---|---|---|---|---|---|---|---|
| | ACT | HSPR | ACT | HSPR | ACT | HSPR | ACT | HSPR |
| A or B | 19.8 | 72.2 | 20.0 | 75.3 | NA | NA | 19.8 | 72.6 |
| Satisfactory/Other | 18.3 | 64.1 | 18.3 | 62.7 | 14.6 | 54.5 | 17.9 | 62.6 |
| Unsatisfactory | 18.9 | 60.4 | 19.2 | 62.3 | 15.8 | 43.3 | 18.8 | 60.4 |
| Total | 18.9 | 65.8 | 18.9 | 64.7 | 14.7 | 53.6 | 18.6 | 64.7 |

Enrolled in Freshman Mathematics

| Course Grade | Took 3 Years of High School Mathematics | | Less Than 3 Years H.S. Mathematics | | Unknown | | Total | |
|---|---|---|---|---|---|---|---|---|
| | ACT | HSPR | ACT | HSPR | ACT | HSPR | ACT | HSPR |
| A or B | 23.7 | 82.0 | 21.8 | 74.0 | 20.7 | 70.0 | 23.4 | 81.0 |
| Satisfactory/Other | 21.8 | 73.0 | 18.7 | 63.9 | 19.1 | 59.3 | 21.3 | 71.2 |
| Unsatisfactory | 21.6 | 69.3 | 20.3 | 62.1 | 18.5 | 55.8 | 21.3 | 67.9 |
| Total | 22.5 | 75.9 | 19.9 | 66.4 | 19.5 | 62.1 | 22.1 | 74.3 |

Enrolled in Advanced Mathematics

| Course Grade | Took 3 Years of High School Mathematics | | Less Than 3 Years H.S. Mathematics | | Unknown | | Total | |
|---|---|---|---|---|---|---|---|---|
| | ACT | HSPR | ACT | HSPR | ACT | HSPR | ACT | HSPR |
| A or B | 26.9 | 90.4 | 24.3 | 84.3 | 23.7 | 81.1 | 26.6 | 89.5 |
| Satisfactory/Other | 25.4 | 82.2 | 23.6 | 70.6 | 22.3 | 69.9 | 24.9 | 80.0 |
| Unsatisfactory | 25.0 | 76.2 | 22.0 | 57.9 | 21.6 | 61.7 | 24.4 | 73.2 |
| Total | 26.2 | 85.8 | 23.6 | 73.8 | 22.7 | 72.7 | 25.7 | 84.0 |

Enrolled in All Levels of Mathematics

| Course Grade | Took 3 Years of High School Mathematics | | Less Than 3 Years H.S. Mathematics | | Unknown | | Total | |
|---|---|---|---|---|---|---|---|---|
| | ACT | HSPR | ACT | HSPR | ACT | HSPR | ACT | HSPR |
| A or B | 23.9 | 82.5 | 21.6 | 75.1 | 22.1 | 74.9 | 23.6 | 81.7 |
| Satisfactory/Other | 21.6 | 72.4 | 18.7 | 63.7 | 18.2 | 60.1 | 20.9 | 70.2 |
| Unsatisfactory | 21.4 | 68.3 | 20.0 | 62.0 | 19.2 | 56.2 | 21.1 | 66.8 |
| Total | 22.5 | 75.8 | 19.7 | 66.1 | 19.5 | 63.4 | 22.0 | 74.0 |

[1] Based on first-time freshmen enrolling at public universities in summer and fall terms of 1988, 1989, and 1990.

Source: Public Universities' High School Feedback System

**Table 14**

**MEAN ACT COMPOSITE SCORE AND HIGH SCHOOL PERCENTILE RANK OF FIRST-TIME FRESHMEN[1] BY SCIENCE COURSE ENROLLMENT AND ACHIEVEMENT AT ILLINOIS PUBLIC UNIVERSITIES**

| | Enrolled in Freshman Science | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | Took 3 Years of High School Science | | Less Than 3 Years H.S. Science | | Unknown | | Total | |
| Course Grade | ACT | HSPR | ACT | HSPR | ACT | HSPR | ACT | HSPR |
| A or B | 25.0 | 83.7 | 21.7 | 74.0 | 22.5 | 74.1 | 24.2 | 81.3 |
| Satisfactory/Other | 22.6 | 74.8 | 19.8 | 63.4 | 20.7 | 61.4 | 21.7 | 71.1 |
| Unsatisfactory | 20.6 | 64.9 | 19.2 | 56.1 | 19.9 | 51.4 | 20.1 | 61.3 |
| Total | 23.3 | 77.1 | 20.3 | 65.5 | 21.2 | 63.6 | 22.5 | 73.6 |

| | Enrolled in Advanced Science | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | Took 3 Years of High School Science | | Less Than 3 Years H.S. Science | | Unknown | | Total | |
| Course Grade | ACT | HSPR | ACT | HSPR | ACT | HSPR | ACT | HSPR |
| A or B | 25.8 | 85.4 | 23.8 | 79.1 | 25.3 | 84.0 | 25.4 | 84.0 |
| Satisfactory/Other | 23.3 | 74.6 | 21.7 | 69.9 | 23.3 | 76.8 | 22.9 | 73.7 |
| Unsatisfactory | 23.0 | 70.4 | 22.6 | 68.8 | 23.0 | 70.6 | 22.9 | 70.0 |
| Total | 24.3 | 78.3 | 22.7 | 72.8 | 23.8 | 77.2 | 23.9 | 77.0 |

| | Enrolled in All Levels of Science | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | Took 3 Years of High School Science | | Less Than 3 Years H.S. Science | | Unknown | | Total | |
| Course Grade | ACT | HSPR | ACT | HSPR | ACT | HSPR | ACT | HSPR |
| A or B | 25.1 | 83.8 | 21.9 | 74.4 | 22.8 | 75.1 | 24.3 | 81.5 |
| Satisfactory/Other | 22.6 | 74.6 | 19.9 | 63.8 | 21.1 | 63.4 | 21.8 | 71.3 |
| Unsatisfactory | 20.8 | 65.4 | 19.5 | 57.3 | 20.4 | 54.0 | 20.4 | 62.1 |
| Total | 23.4 | 77.2 | 20.5 | 66.0 | 21.5 | 65.3 | 22.6 | 73.8 |

[1] Based on first-time freshmen enrolling at public universities in summer and fall terms of 1988, 1989, and 1990.

Source: Public Universities' High School Feedback System

A study by Southern Illinois University at Edwardsville, reported in its 1991 Undergraduate Education Review Report, supports these observations on the information from the High School Feedback System. In fall 1990, Southern Illinois University at Edwardsville implemented revised admission standards that incorporate the high school course-specific requirements that will become effective statewide in fall 1993. During academic year 1990-91, the University conducted a follow-up study of a random sample of students admitted under the new requirements. Of the 281 freshmen in the sample, 217 met the four years of English requirement, 205 met the three years of mathematics requirement, 177 met the three years of social science requirement, and 150 met the three years of laboratory science requirement. Those students with higher ACT scores were more likely to have satisfied the requirements. As a result of the new admission requirements, the University found that enrollment in remedial writing courses declined from 740 in fall 1989 to 574 in fall 1990, and enrollment in remedial reading courses declined from 598 in fall 1989 to 496 in fall 1990. Enrollment in mathematics courses below college algebra, however, essentially remained the same at 456 in fall 1989 and 464 in fall 1990. The University found that students can complete three years of high school mathematics without becoming proficient in high school-level algebra.

## Conclusions and Next Steps: School-College Partnerships

The information on access to higher education, on student academic preparation for college, and on freshman performance in higher education presented in this report leads to the following general conclusions:

- From 1986 to 1990, the number of Illinois graduating seniors declined by just under seven percent, while the number of first-time freshmen entering Illinois institutions of higher education increased by 3.6 percent.

- The greatest increase in enrollment of first-time freshmen occurred in public community colleges, at 14.8 percent.

- There is a wide range in student achievement at each schooling level, as indicated by scores on state and national tests of student achievement and of aptitude for college work. Various standardized tests indicate that, while the top high school graduating seniors achieve at high levels, they are very few in number. Test scores further indicate that the majority of graduating seniors have not achieved the level of verbal, quantitative, and reasoning skills essential for success in college work.

- Although the gap in achievement between minority and majority students is narrowing, the achievement of minority students on average continues to be lower than the achievement of majority students. The achievement of females in mathematics and science continues to be lower than that of males.

- The number of Illinois ACT test takers who reported taking the recommended core college-preparatory curriculum in high school increased by 65 percent over the past five years, from 16,481 in 1987 to 27,152 in 1991. In 1991, 37 percent of the Illinois test takers reported taking the complete college-preparatory curriculum.

- Most first-time freshmen entering Illinois public universities in 1988 through 1990 completed the recommended number of years of English, mathematics, and science that will be required for admission statewide in fall 1993. From 1988 through 1990, at least 84 percent of the public university first-time freshmen completed four years of English, 82 percent completed three (or more) years of mathematics, and 69 percent completed three (or more) years of science in high school.

- Completing only a specified number of years of a subject in high school, however, is not sufficient by itself to guarantee adequate preparation for collegiate study. The level and content of the courses completed, the grade earned in each course, and the academic standards of the high school attended all contribute to the adequacy of a student's preparation.

- ACT composite scores, high school percentile rank, and high school course-taking patterns are interrelated measures of student achievement that together can predict student performance in the freshman year of college.

- A student's ACT composite score and high school percentile rank are positively related to first-term college performance. The number of years of a subject a student completed in high school also relates positively to the level of that subject and the grade the student earns in it during the first term in college.

- A small proportion of students enroll in remedial coursework in higher education institutions in Illinois. In fiscal year 1991, only five percent of the total annual credit hours generated in the public community college system were remedial, with more students enrolling in remedial mathematics than in remedial reading or writing. Over a three-year period, only seven percent of the first-time freshmen who entered public universities enrolled in a remedial English course, while 13 percent enrolled in a remedial mathematics course.

- A significant proportion of first-term freshmen in public universities are unsuccessful, with one in five failing their first course in mathematics, and one in five failing their first science course.

- The level of student academic preparation for college and the level of first-term performance in college described in this report indicate that the revisions to entry-level assessment for course placement purposes, increased attention to the freshman year and to retention, and increased levels of student support through tutoring programs and supplemental sections in gateway courses, as reported in *Undergraduate Education: Learning and Teaching*, are both warranted and necessary.

- The level of student academic preparation for college described in this report also indicates that colleges and universities in working with schools and the Board of Higher Education in working with the State Board of Education should give renewed emphasis to informing high school students and their parents and teachers of the expected level of preparation for admission to and success in college.

The information on student academic achievement presented in this report indicate that colleges and universities cannot rely on traditional recruitment practices--school visits, college nights or fairs, and the mailing of materials--to improve the academic preparation of students. While these practices are important both to the student's college-choice process and to college and university admission processes, they come too late in the student's educational career to influence high school course selection.

Thus, the Board's policies on student preparation, access, and retention call on colleges and universities not only to inform high school students of the expected level of preparation for collegiate work, but also to "assist schools in strengthening the preparation of high school students." Further, the High School Feedback System was specifically identified as a basis for establishing "cooperative efforts between schools and colleges and universities to strengthen the preparation of students." The Joint Committee on Minority Student Achievement report, *Our Future at Risk* (June 1988), also called on schools and colleges/universities, as well as the Board of Higher Education and the State Board of Education, to work cooperatively to "make minority student achievement a priority in Illinois." Finally, the policies adopted at the recommendation of the Committee to Study Preparation of the

Workforce also call on colleges and universities to develop partnerships with schools in order to strengthen student preparation for college and for work, to provide opportunities to high school students for advanced instruction, and to improve the preparation of teachers and counselors.

School-college partnerships to improve students' preparation for college have taken a variety of forms. Colleges and universities, individually and in consortia, are providing outreach programs for elementary and secondary students to assist and motivate at-risk students to prepare for college and to encourage able students to pursue more demanding fields. Some colleges and universities are working with high schools to articulate coursework between levels and, in some cases, to make advanced coursework available to students in schools that cannot themselves offer advanced courses. Colleges and universities also prepare elementary and secondary teachers, counselors, and administrators, with schools serving as sites for student teaching and internship experiences. Many colleges and universities provide in-service training and professional development opportunities for teachers and administrators, as well. Finally, schools and colleges/universities have worked cooperatively to develop and test new curricula, teaching strategies, and teaching materials and to conduct research on mutually beneficial topics.

Some Illinois school-college partnership efforts are supported by state grant funds. In fiscal year 1992, for example, the Board of Higher Education awarded approximately $2.5 million in grants from the Higher Education Cooperation Act for early outreach programs and approximately $2 million in grants from the federal Dwight D. Eisenhower Mathematics and Science Education Program for in-service training for elementary and secondary mathematics and science teachers. A number of community colleges are receiving grant funds from the State Board of Education to establish Tech-Prep programs in cooperation with schools in their districts to better prepare students for technical careers. Colleges and universities are also receiving funding from the State Board of Education's Scientific Literacy Program to improve mathematics and science education.

In May 1991, the Board of Higher Education directed the staff to "consult with the Governor and the Lieutenant Governor, members of the General Assembly, and the State Board of Education on the development and coordination of programs to improve teaching and learning at all levels of education" (*Priorities for School-College Partnerships*). Since May, the Board of Higher Education and State Board of Education staffs have been meeting regularly to exchange information and to develop better methods for coordinating efforts common to both. Initially, these cooperative efforts have focused on (1) sharing program review information in order to improve teacher education programs, (2) coordinating the awarding of Board of Higher Education Dwight D. Eisenhower Mathematics and Science Education Program grants with the State Board of Education's Eisenhower Program formula funding to schools and the Scientific Literacy Program grants, and (3) coordinating the further development of student assessment and academic progress monitoring systems.

Because available assessment and monitoring information indicates that the improvement of mathematics and science education across the state is critical, in October 1991, the Board of Higher Education joined with the State Board of Education and the Governor's Office to apply for a $10 million five-year State Systemic Initiative grant from the National Science Foundation (NSF) to restructure mathematics and science education in Illinois. Of the 33 state applications, 15 were selected to receive site visits. The Illinois proposal was one of these 15. The Illinois site visit took place January 29-31st. The Foundation expects to announce the awarding of ten grants in May 1992.

The Illinois Systemic Initiative will bring together into a coherent, systematic process the various efforts already underway to restructure the teaching of mathematics and science from kindergarten through graduate school. Through the Initiative, Action Teams comprised of expert mathematics and science educators and practitioners will identify "best practices" in teaching strategies, materials, instrumentation, and curriculum from Illinois and across the nation. Then, a formal network of service providers--the Illinois Mathematics and Science Academy; the Chicago Teachers Academy for

Mathematics and Science; teacher education, mathematics, science, and engineering faculties; university mathematics and science education centers and institutes; professional organizations such as the Illinois Association of Science Teachers and the Illinois Council of Teachers of Mathematics; the education offices of Fermilab, Argonne, and Illinois museums, planetaria, and zoos; and the mathematics and science consultants in the 18 Educational Service Centers--will assist individual schools by training teachers to implement these practices in their classrooms. In the first year of the program, if it is funded, 180 primary (kindergarten through fourth grade) schools will participate, with 180 new schools and succeeding grade levels brought into the system in each of the following four years.

The staff sees the Illinois Systemic Initiative as one means of strengthening and realigning efforts to coordinate mathematics and science education improvement programs with the State Board of Education. For example, the Board of Higher Education and the State Board of Education staffs have already begun to coordinate the Dwight D. Eisenhower Mathematics and Science Education Program in-service teacher training programs and the State Board of Education's Scientific Literacy program. Once the Initiative has identified best practices at each grade level, however, the objectives and criteria for awarding and evaluating Higher Education Cooperation Act minority outreach and transfer and articulation grants, as well as the Dwight D. Eisenhower Mathematics and Science Education Program grants and the State Board of Education's programs, can be revised in line with these exemplary curriculum and instructional strategies. In addition, staff will work not only with the State Board of Education staff but also with the Illinois Mathematics and Science Academy and with higher education institutions to revise program approval, program review, and budget development objectives and criteria for teacher education programs, general education curricula, and student assessment, feedback, and monitoring systems in line with these identified best practices. Finally, the staff sees the Illinois Systemic Initiative as another avenue for working with the State Board of Education, the Illinois Community College Board, and colleges and universities to avoid wasteful duplication of services, to identify gaps that need to be filled, and to reallocate efforts to high priority and high quality programs.

The information on student preparation presented in this report suggests that other steps are also needed. Scores on standardized tests measuring verbal skills suggest that students' reading, writing, and interpretive skills also must be improved. The development of reading, writing, and critical thinking skills across the elementary and secondary curriculum needs to be incorporated into teacher education and in-service training programs, just as colleges and universities are incorporating baccalaureate-level skills development across undergraduate education. Additional information on college student performance needs to be provided to high schools to assist them in improving their college-preparatory curricula. The expansion of the High School Feedback System to include student achievement through the first full year of college is a good start. In addition, however, the High School Feedback System needs to provide high schools with information on the persistence/non-persistence, transfer, and graduation of their graduates. Finally, colleges and universities need to focus their efforts on improving the achievement within individual low-achieving schools and to target early outreach programs to the vast middle-range of students who do not appear to progress beyond the intermediate, average levels of academic performance. The proposed Systemic Initiative in mathematics and science may well serve as a model for redirecting efforts at both the state and institution level.

The Joint Education Committee, comprised of members of both the Board of Higher Education and the State Board of Education, has as its charge the examination of issues of mutual concern. The topics examined in this report--student preparation for college, access to and performance in college, and school-college partnership efforts to improve education at all levels--are topics appropriate for further examination by the Joint Education Committee.

This report on access and preparation focused on the implementation of the Board's policies on college and university admission requirements and on the Board's policies on student preparation,

access, and retention. The report, *Undergraduate Education: Learning and Teaching*, presented in January and attached as Item #8B, focused on the implementation of the policies on student achievement, scholarship, and general education and on faculty and excellence in teaching. The third report, planned for May, will analyze implementation of the policies on student transfer and program articulation. Together, this series of reports presents a comprehensive picture of the current status of undergraduate education in Illinois public higher education.

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## APPENDIX A

### TEXT OF PUBLIC ACT 86-0954
### December 1989

*(a) Commencing in the fall of 1993, no new student shall then or thereafter be admitted to instruction in any of the departments or colleges of [the university] unless such student also has satisfactorily completed:*

*(1) at least 15 units of high school coursework from the following 5 categories:*

*(A) 4 years of English (emphasizing written and oral communications and literature);*
*(B) 3 years of social studies (emphasizing history and government);*
*(C) 3 years of mathematics (introductory through advanced algebra, geometry, trigonometry, or fundamentals of computer programming);*
*(D) 3 years of science (laboratory sciences); and*
*(E) 2 years of electives in foreign language, music, vocational education, or art;*

*(2) except that institutions may admit individual applicants if the institution determines through assessment or through evaluation based on learning outcomes of coursework taken, including vocational education courses, that the applicant demonstrates knowledge and skills substantially equivalent to the knowledge and skills expected to be acquired in the high school courses required for admission. Institutions may also admit 1) applicants who did not have an opportunity to complete the minimum college-preparatory curriculum in high school and 2) educationally disadvantaged applicants who are admitted to the formal organized special assistance programs that are tailored to the needs of such students, providing that in either case, the institution incorporates in the applicant's baccalaureate curriculum courses or other academic activities that compensate for course deficiencies; and*

*(3) except that up to 3 of the 15 units of coursework required by paragraph (1) of this subsection may be distributed by deducting no more than one unit each from the categories of social studies, mathematics, sciences, and electives and completing those 3 units in any of the 5 categories of coursework described in paragraph (1).*

*(b) When allocating funds, local boards of education shall recognize their obligation to their students to offer the coursework required by subsection (a).*

Public Act 86-0954 amended the Acts of each of the four public university systems. Because of the following paragraph in the Illinois Public Community College Act, however, the admission requirements also apply to the baccalaureate-transfer programs offered by the Illinois public community colleges:

*Students allowed entry in college transfer programs must have ability and competence similar to that possessed by students admitted to state universities for similar programs. Entry level competence to such college transfer programs may be achieved through successful completion of other preparatory courses offered by the college.* (Section 103, paragraph 17)

APPENDIX B

BOARD OF HIGHER EDUCATION POLICIES
ON STUDENT PREPARATION, ACCESS, AND RETENTION
September 1990

- Colleges and universities shall assist in improving the preparation of students by informing potential students, parents, and schools of expectations for adequate academic preparation and by assisting schools in strengthening the preparation of high school students.

- Each college and university shall establish specific criteria for admission to baccalaureate and baccalaureate-transfer programs of applicants who do not meet the institution's requirements for regular admission.

- In the development of policies and procedures for admission of students who do not meet their requirements for regular admission, colleges and universities should provide opportunities to applicants who did not have an opportunity to complete a college-preparatory curriculum in high school and to educationally disadvantaged applicants who are admitted to formally organized special assistance programs tailored to meeting their needs.

- Colleges and universities should assure that the academic, social, and financial support services needed to maximize the opportunity for all students to succeed are provided throughout the college experience and should assure that students receive regular academic advising.

- Colleges and universities should treat participants in intercollegiate athletics similarly to other undergraduate students. Intercollegiate athletes should be recruited and admitted to academic programs in which they can be expected to succeed and should have regular access to classroom instruction, advising, academic services, and student life programs. Their academic progress and graduation pace and rate should be comparable to that of other undergraduates in the same academic programs. Colleges and universities should make available to students being recruited for athletic participation information on the progress, retention, and completion of cohorts of student athletes.

- Colleges and universities should assure that the academic needs of all admitted students are identified through institutionally established assessment programs. Although community colleges should continue to play a leading role in remedial education, all colleges and universities should provide admitted students needed remedial coursework as identified through the institutional assessment process. Universities are encouraged to establish cooperative arrangements with community colleges to provide remedial coursework to university students with deficiencies in writing, reading, and mathematical skills.

- Remediation at the postsecondary level is coursework that is designed to correct skills deficiencies in writing, reading, and mathematics that are essential for college study. No credit toward degree completion shall be granted for remedial coursework.

- Colleges and universities should provide recognition and development programs for faculty members involved in remedial programs and academic support services and should encourage the application of new technologies and research in learning and skill development that enhance work in these areas.

- The statewide system for providing high schools information on the academic progress of undergraduate students shall be continued by the Illinois Board of Higher Education in cooperation with colleges and universities. This information system will be used to inform high schools of the progress and achievement of recent high school graduates in college and will

provide the basis for cooperative efforts between schools and colleges and universities to strengthen the preparation of students.